High performance sustainable bio-based packaging with tailored end of life and upcycled secondary use

PRESERVE

This project is funded by the Horizon 2020 Framework Programme of the European Union under Grant Agreement Number **952983**

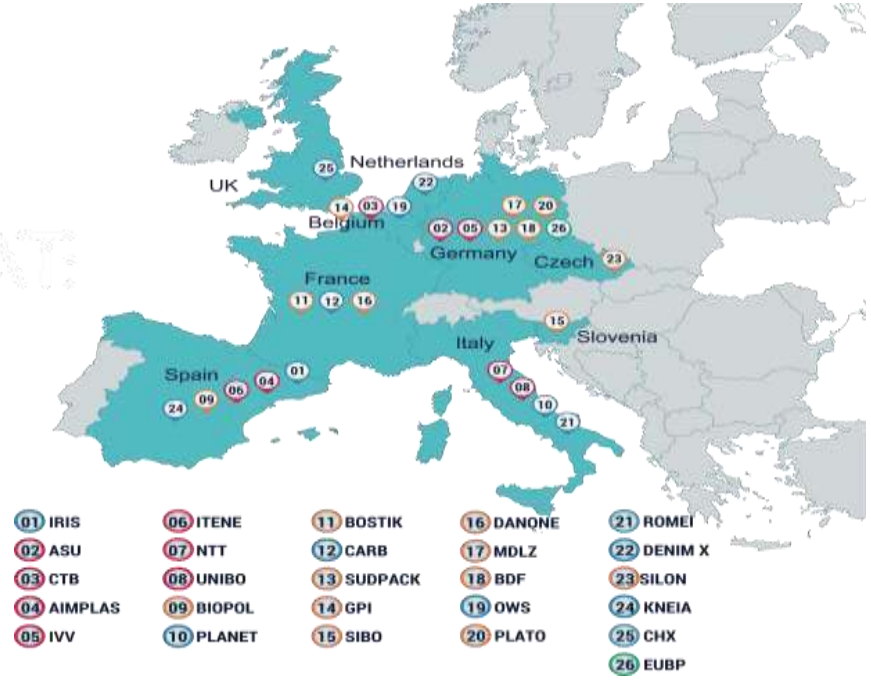
Preserve: Main figures

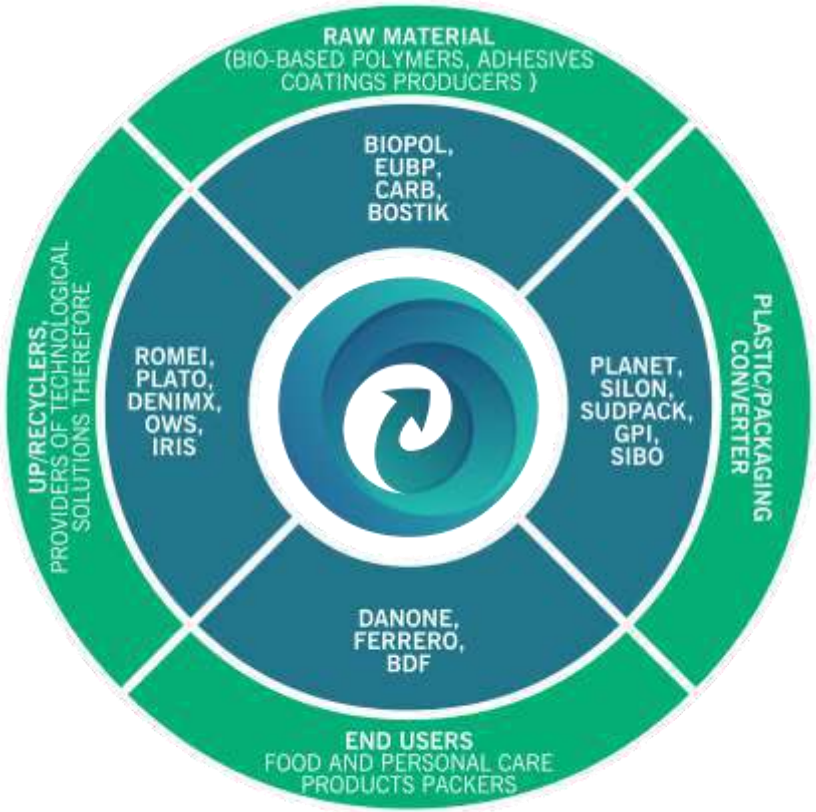
- **4 years (January 2021- Dec 2024)**

Funding from EC Horizon 2020 programme under the topic:

CE-BIOTEC-09-2020 Upcycling Bio Plastics of food and drinks packaging.

- **26 partners** including 7 research organisations, partners along the circular supply & value chain with large end users and the largest bioplastics producer/users' association.





Circular PRESERVE Value chain (only business partners, no RTOs or support service providers)

Why Preserve is needed?

Europe is far from its targets in terms of CO_2 footprint (neutrality by 2050) and circular economy (all plastic packaging recyclable by 2030)!

- EU consumes in the range of 50 M T/year fossil-derived plastics, 40% of which for packaging
- Only 32% of plastic wastes is currently recycled
- Globally over 30% of the plastic packaging leaks in the environment leading to dramatic long-term pollution.
- Bioplastics have advantages in terms of renewable feedstocks (leading to lower CO2 footprint in general) and EoL modularity but still represents a very limited share of plastics (ca. 1-2%).

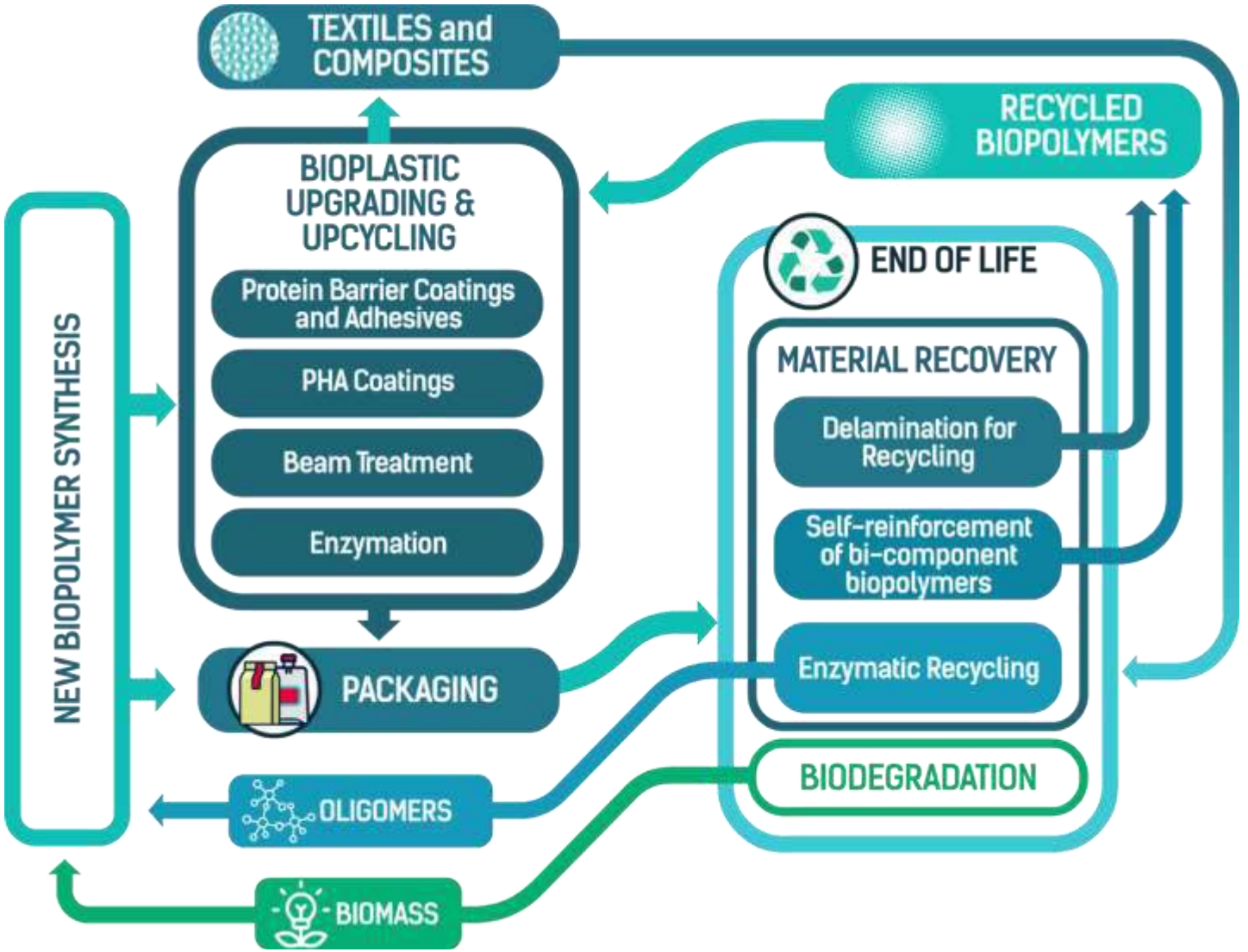
Why Preserve is needed?

Europe is far from its targets in terms of CO_2 footprint (neutrality by 2050) and circular economy (all plastic packaging recyclable by 2030)!

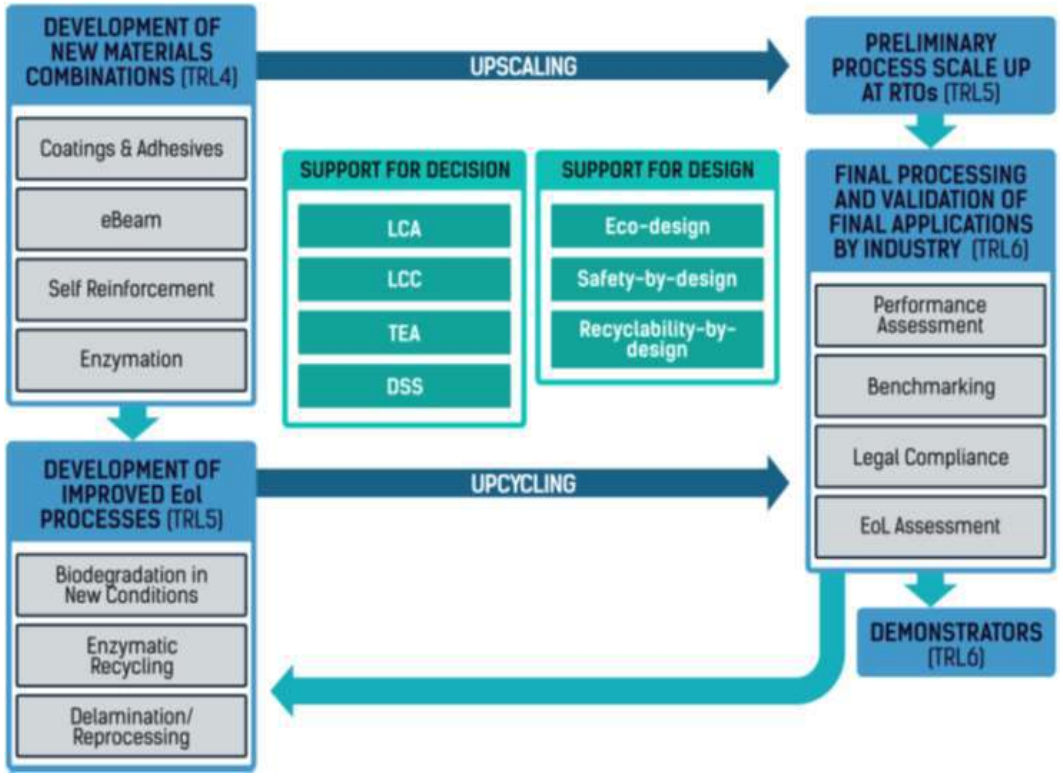
- High performance bio-based materials need to be developed and produced.
- Their recycling approaches need to be better stablished and in motion.
- Biodegradability of biopolymers applications to be expanded to more environiemnts and environtments.

Preserve objectives

- PRESERVE biomaterials upcycling strategies include self-reinforcement, eBeam-assisted material enhancement, removable coatings & adhesives.
- They will be fit for tailored EoL scenarios including reprocessing via self-reinforcement or after delamination, enzymatic recycling or enzyme-stimulated biodegradation.
- PRESERVE circular renewably sourced packaging solutions and derived upcycled packaging applications will optimally *preserve the packed good* but also our finite material and energy resources and the environment.
- Our technologies have many other potential uses such as pharma and service packaging, tableware, mulching films, agro-textiles, other textiles and composite applications



Technical activities to reach Preserve solutions



<u>Technologies applied in PRESERVE :</u>

- Protein- based coatings and adhesives.
- PHA coatings.
- eBeam treatment of biopolymers.
- Use of biopolymers for personal care and transport packaging.
- Reinforcement of biocomponents biopolymers.
- Delamination.
- Enzymes-based recycling.

Bio-based packaging for food & drinks (Primary upcycled bioplastics)

Snack pack flowpack

Film and tray for dairy packaging

Film and tray injected bottles for meat packaging

Beverage brick

Pulp moulded packaging

Secondary raw material upcycling into cosmetic packaging, textiles & composites

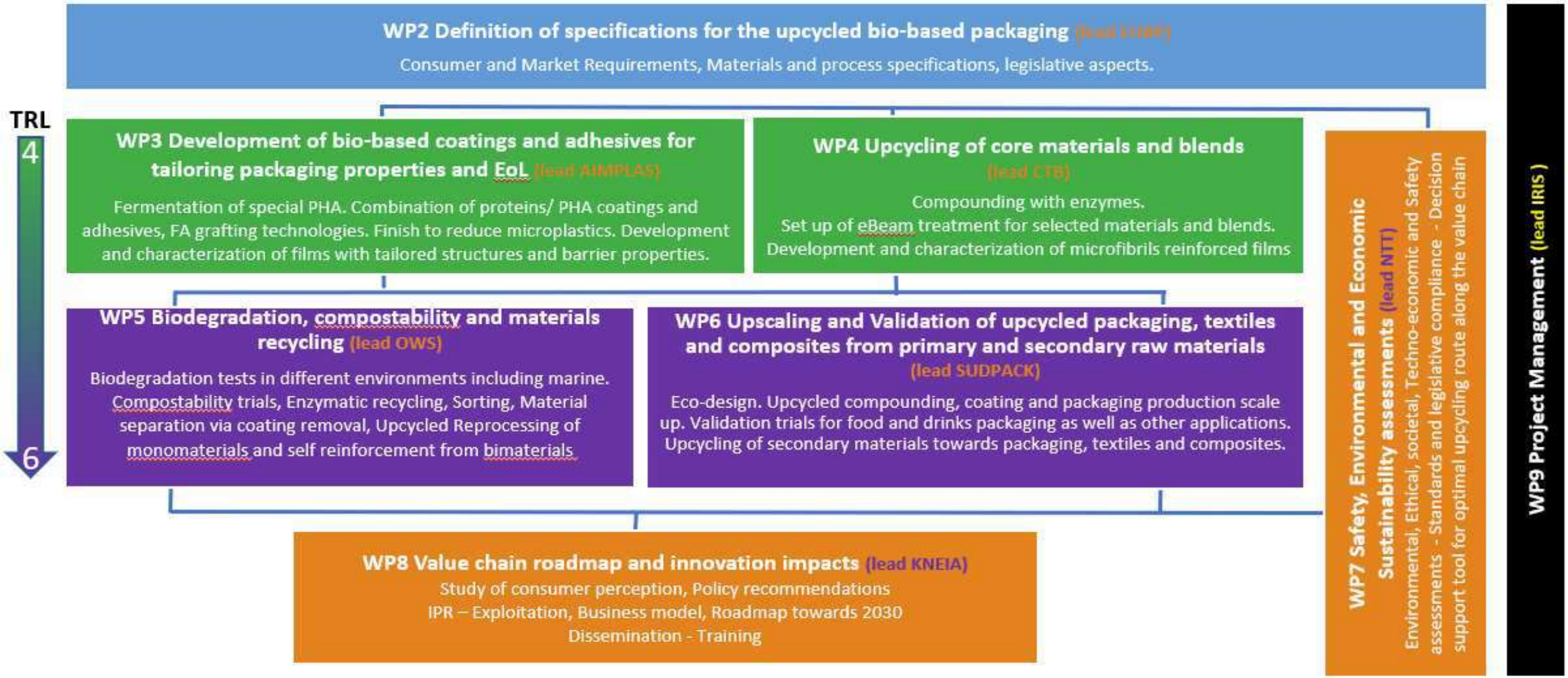
Packaging textile (reusable shopping bags)

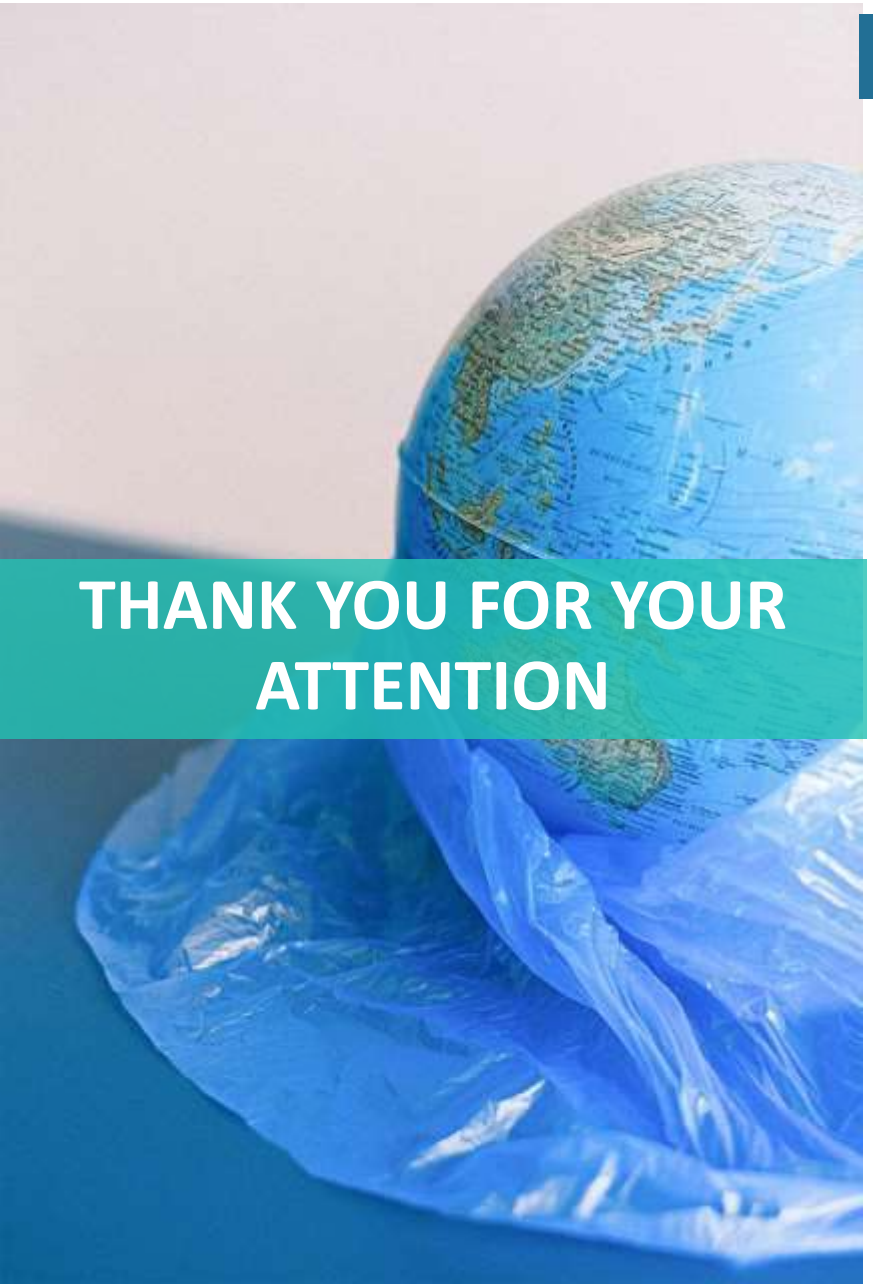
Personal care (wet wipes)

Composites (Carrier boxes and cases)

Small

Personal care injected jar


WP2 Definition of specifications for the upcycled bio-based packaging (lead EVABIO)
Consumer and Market Requirements, Materials and process specifications, legislative aspects.
TRL
4
6
WP3 Development of bio-based coatings and adhesives for tailoring packaging properties and EoL (lead AIMPLAS)
Fermentation of special PHA. Combination of proteins/ PHA coatings and adhesives, FA grafting technologies. Finish to reduce microplastics. Development and characterization of films with tailored structures and barrier properties.
WP4 Upcycling of core materials and blends (lead CTB)
Compounding with enzymes.
Set up of eBeam treatment for selected materials and blends.
Development and characterization of microfibrils reinforced films
WP5 Biodegradation, compostability and materials recycling (lead OWS)
Biodegradation tests in different environments including marine.
Compostability trials, Enzymatic recycling, Sorting, Material separation via coating removal, Upcycled Reprocessing of monomaterials and self reinforcement from bimaterials
WP6 Upscaling and Validation of upcycled packaging, textiles and composites from primary and secondary raw materials (lead SUDPACK)
Eco-design. Upcycled compounding, coating and packaging production scale up. Validation trials for food and drinks packaging as well as other applications.
Upcycling of secondary materials towards packaging, textiles and composites.
WP8 Value chain roadmap and innovation impacts (lead KNEIA)
Study of consumer perception, Policy recommendations
IPR – Exploitation, Business model, Roadmap towards 2030
Dissemination - Training
WP7 Safety, Environmental and Economic Sustainability assessments (lead NTT)
Environmental, Ethical, societal, Techno-economic and Safety assessments - Standards and legislative compliance - Decision support tool for optimal upcycling route along the value chain
WP9 Project Management (lead IRIS)



THANK YOU FOR YOUR ATTENTION

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